

What is claimed is:

1. A colorimetric sensor for detecting a particular material in the air, comprising a receptor molecule specifically binding with the particular material
5 in the air, and a polymer molecule whose light absorbency is altered due to binding of the particular material and the receptor molecule.
2. The colorimetric sensor according to claim 1, wherein said receptor molecule is linked to the polymer molecule at a portion of the receptor molecule not participating in binding with the particular material.
- 10 3. The colorimetric sensor according to claim 1 or 2, wherein said alteration in light absorbency of the polymer molecule is caused by a molecular structural alteration in the polymer molecule.
4. The colorimetric sensor according to claim 3, wherein said polymer molecule includes polydiacetylene.
- 15 5. The colorimetric sensor according to claim 1 or 2, wherein said alteration in light absorbency of the polymer molecule is caused by an alteration in an electron distribution state in the polymer molecule.
6. The colorimetric sensor according to claim 5, further comprising a complex consisting of an electron-withdrawing material and a ligand specific for
20 the receptor molecule, wherein said complex being linked to the receptor molecule via the ligand.
7. The colorimetric sensor according to claim 5 or 6, wherein said polymer molecule is selected from a group consisting of polythiophene, oligothiophene, polypyrrole and polyvinylcarbazole.
- 25 8. The colorimetric sensor according to claim 7, wherein said polymer molecule is polyvinylcarbazole.

9. The colorimetric sensor according to any one of claims 6 to 8, wherein said ligand is selected from a group consisting of viruses, antigens and biotin.
10. The colorimetric sensor according to any one of claims 6 to 9, wherein said electron-withdrawing material is selected from a group consisting of anthraquinone, tetracyanoquinodimethane, trinitrofluorenone and dinitrofluorenone.
11. The colorimetric sensor according to any one of claims 1 to 10, wherein said receptor molecule is selected from a group consisting of sialic acid, ganglioside, antibodies, antibody fragments and avidin.
- 10 12. The colorimetric sensor according to any one of claims 1 to 11, further comprising a water-retaining means.
13. The colorimetric sensor according to claim 12, wherein said water-retaining means includes a porous material.
14. The colorimetric sensor according to claim 13, wherein said porous material is selected from a group consisting of zeolite and porous sintered products.
- 15 15. The colorimetric sensor according to claim 12, wherein said water-retaining means includes an absorbent polymer.
16. The colorimetric sensor according to claim 15, wherein said absorbent polymer is selected from a group consisting of alginic acid, dextran, collagen, cellulose derivatives, starch derivatives, polyvinyl alcohol and sodium polyacrylate.
- 20 17. The colorimetric sensor according to claim 16, wherein said cellulose derivative is selected from a group consisting of carboxymethylcellulose, methylcellulose and ethylcellulose.
- 25 18. The colorimetric sensor according to any one of claims 1 to 11, wherein

said polymer molecule is modified so as to have a water-absorbing ability.

19. A filter for an air conditioner equipped with the colorimetric sensor as defined in any one of claims 1 to 18.

20. An apparatus for confirming a lifetime of a filter for an air conditioner,
5 comprising a solution containing the colorimetric sensor as defined in any one of claims 1 to 19, a solution bath for retaining the solution, and a means for bubbling the air before and/or after passing through the filter in the solution.

21. An air conditioner equipped with the filter as defined in claim 19.

22. An air conditioner equipped with the apparatus as defined in claim 20.

10 23. The air conditioner according to claim 21 or 22, wherein said colorimetric sensor is placed at an upstream and/or downstream side of the filter and is placed so as to contact with the air which has not been heat-exchanged.

24. The air conditioner according to any one of claims 21 to 23, wherein
15 said colorimetric sensor is controlled so as to be maintained at a suitable temperature for binding with the particular material without depending upon a working state of the air conditioner.

25. The air conditioner according to any one of claims 21 to 24, further
20 comprising an optical sensor for detecting a color change of the colorimetric sensor.

26. A method for confirming a lifetime of a filter for an air conditioner, comprising using the colorimetric sensor as defined in any one of claims 1 to 18.